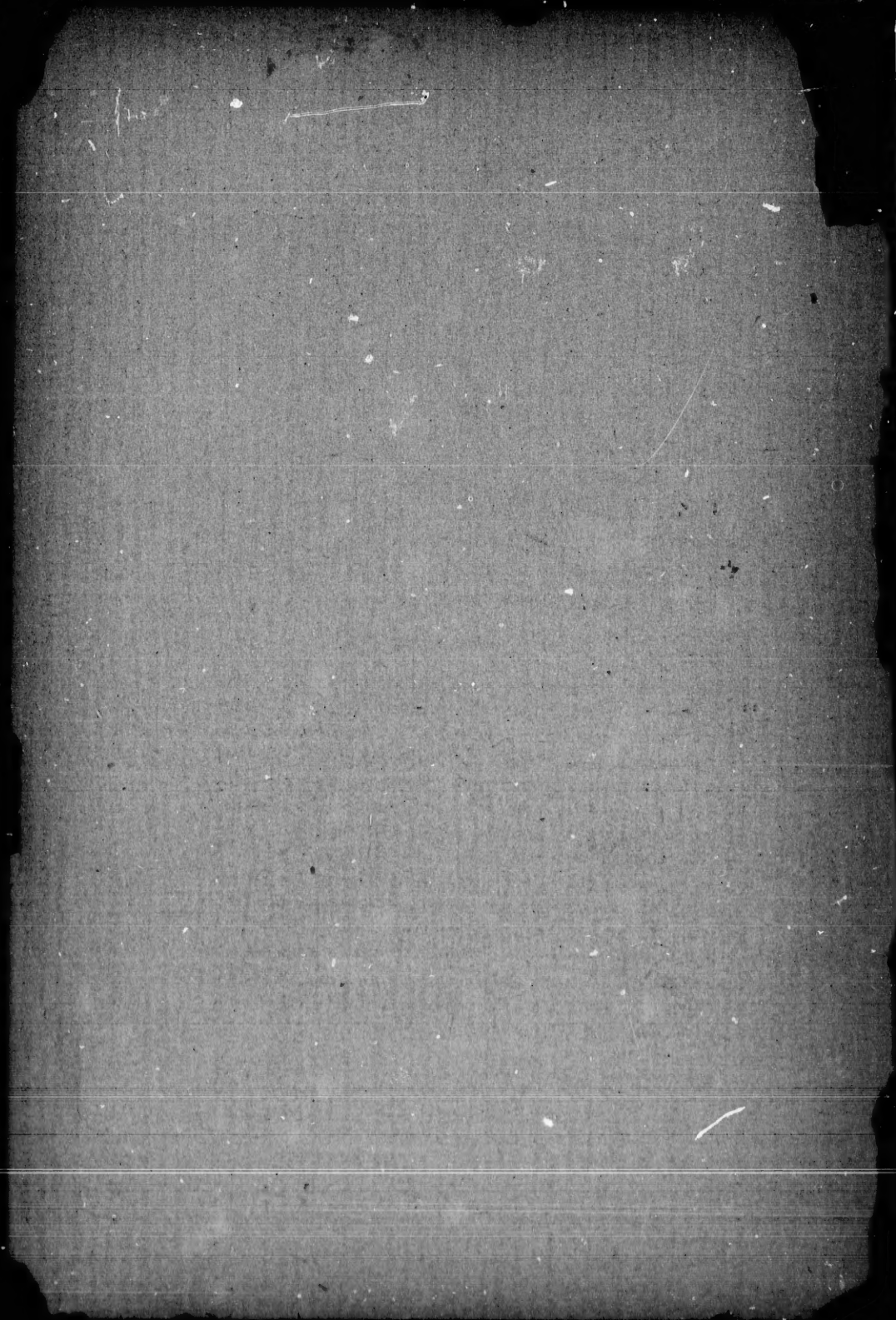


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**Notes on the Gasteropoda of the Trenton
limestone of Manitoba, with a descrip-
tion of one new species.**

By J. F. WHITEAVER.



Notes on the Gasteropoda of the Trenton limestone of Manitoba, with a description of one new species.¹

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According to the latest researches of the officers of the Canadian Geological Survey, the Trenton limestone of Lake Winnipeg and the Red River valley in Manitoba consists "at the bottom of a mottled buff and grey dolomitic limestone, found at Big and Swampy Islands, etc., and probably also at East Selkirk, above which are other horizontal evenly bedded limestones and dolomites, amounting in all to a few hundred feet and all more or less rich in fossils."² In the present communication the words Trenton limestone will be used to designate all those rocks which intervene between the white quartzose sandstone which is supposed to be the local representative of the St. Peter's sandstone of Wisconsin, etc., and the Hudson River formation, thereby including all those rocks in Manitoba which have previously been referred to the Galena limestone.

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² Tyrrell, *Trans. Roy. Soc., Canada*, for 1891, vol. ix, sect. 4, p. 91.

The specimens to which these notes refer are, with very few exceptions, in the Museum of the Geological Survey at Ottawa, and in the enumeration of the different species it has not been thought either necessary or desirable to quote all their synonyms and references, but only such as are most likely to be useful to Canadian students.

RAPHISTOMA LENTICULARE.

- Pleurotomaria lenticularis* (Sowerby) Hall. 1847. Pal. St. N. York
vol. 1, p. 172, pl. xxxviii,
fig. 6.
" " " Owen. 1844. Geol. Rep. Iowa,
Wisc. and Minn., p. 86,
pl. xviii, fig. 6.
Pleurotomaria Americana, Billings. 1860. Can. Nat. and Geol., vol.
vi, p. 164, fig. 7.
Pleurotomaria lenticularis (Sowerby) Nicholson. 1875. Rep. Paleont,
Prov. Ont., p. 19, fig. 7d.
Raphistoma lenticularis, Whitfield. 1882. Geol. Wisconsin, vol. iv, p.
214, pl. vi, figs. 4 and 5.

Lower Fort Garry, D. Dale Owen, 1848. Cat Head,
Lake Winnipeg, T. C. Weston, 1884: one specimen. Birch
Island, Kinnow Bay, Lake Winnipeg, T. C. Weston, 1884,
one specimen, and Messrs. Dowling & Lambe, 1890, two
specimens. One or two specimens of this species, also,
were collected by Messrs. Dowling & Lambe in 1890 and
1891, at the Dog's Head and at Commissioners (or Cran-
berry), Snake, and Little Tamarack islands, Lake Winnipeg.

All the specimens collected at these localities are badly
preserved casts of the interior of the shell. They are
obviously conspecific with the fossils from the Trenton lime-
stone of the States of New York and Wisconsin, which
Professors Hall and Whitfield have identified with the
Pleurotomaria lenticularis of Sowerby. Similar, but some-
times better preserved specimens, are common in the Tren-
ton limestone of Ontario and Quebec, and in the Hudson
River formation of the Island of Anticosti.

Salter, however, in 1859, expressed the opinion that the

American fossils which had then been referred to *P. lenticularis*, Sowerby, are distinct from that species, and in the following year E. Billings maintained that three species, which he then described and figured under the names *Pleurotomaria Progne*, *P. Americana* and *P. Helena*, had been mistaken for the true *P. lenticularis*. The specimens so far collected in Manitoba are too imperfect to be identified with much certainty, but they all appear to belong to the form which Billings proposed to distinguish as *P. Americana*.

Lindström, on page 108 of his valuable monograph "on the Silurian Gasteropoda and Pteropoda of Gothland," states that the shell which Conrad figured as *P. lenticularis*, Sowerby, in 1848, in Emmons' Geological Report of the Third District of the State of New York, is *P. qualteriata*, Schlotheim, and that it is "quite different" from the *P. lenticularis* of Hall.

PLEUROTOMARIA SUBCONICA.

- Pleurotomaria subconica*, Hall. 1847. Pal. St. N. York, vol. i, pp. 174 and 304, pls. xxxvii, fig. 8, & xxxviii, fig. 3.
" " Billings. 1863. Geol. Canada, p. 180, fig. 174.
" " Whitfield. 1882. Geol. Wiscons., vol. iv, p. 216, pl. vi, fig. 1.

The Dog's Head (two specimens), and Stony Point (one specimen), Lake Winnipeg, T. C. Weston, 1884.

PLEUROTOMARIA MURALIS.

- Pleurotomaria muralis*, D. D. Owen. 1852. Rep. Geol. Surv. Wisc., Iowa and Minn., p. 531, pl. ii, fig. 6.

"Lower Fort Garry, Red River of the North," Owen (op. cit., p. 626). A natural mould of the exterior of the test of the upper portion of a specimen, collected by Dr. R. Bell, in 1879, at the Limestone Rapid 100 miles up the Nelson River, Keewatin, and a very badly preserved specimen collected by Mr. Dowling, in 1891, at the Dog's Head, Lake Winnipeg, are both possibly referable to this species.

MURCHISONIA MILLERI.

Murchisonia bicincta, Hall. 1847. Pal. St. N. York, vol. 1, p. 177, p. xxxviii, figs. 5a-h. But not *M. bicincta* McCoy, 1846.

" " Salter. 1859. Geol. Surv. Can., Org. Rem., Dec. 1, p. 19, pl. iv, figs. 5 & 6.

Murchisonia Milleri, Hall, 1877. In Miller's Am. Pal. Foss., ed. 1, p. 244.

Pleurotomaria bicincta, Lindstrom. 1884. Sil. Gastr. and Pterop. Gothland, p. 106, pl. viii, figs. 15-25.

Elk Island, Lake Winnipeg, Dr. A. R. C. Selwyn, 1872: one imperfect and badly preserved specimen. Snake Island (near the Dog's Head) in the same lake, Messrs. Dowling and Lambe, 1890: a well preserved mould of the exterior of the shell.

MURCHISONIA GRACILIS.

Murchisonia gracilis, Hall. 1847. Pal. St. N. York, vol. 1, p. 181, pl. xxxix, figs. 4, a, b, c.

" " Salter. 1859. Geol. Surv. Can., Can. Org. Rem., Dec. 1, p. 22, pl. v, fig. 1.

" " Billings. 1863. Geol. Canada, p. 183, fig. 178.

" " Nicholson. 1875. Rep. Pal. Prov. Ont., p. 18, fig. 7c.

Snake Island, Messrs. Dowling & Lambe, 1890: four casts of the interior of the shell.

MURCHISONIA BELLICINCTA, VAR. TERETIFORMIS.

Murchisonia teretiformis, Billings. 1857. Geol. Surv. Can. Rep. Progr. 1853-56, p. 298.

" " " 1886. Cat. Sil. Foss. Isld. Anticosti, pp. 18 & 55.

Murchisonia bellicincta, Whiteaves. 1880. Geol. Surv. Can., Rep. Expl. and Surv., 1878-79, pp. 47c, and 48c.

Cfr. also *Murchisonia major*, Hall. 1851. In Foster and Whitney's Rep. Geol. Lake Super. Land Distr., p. 209, pl. xxvi, figs. 1 a-c.

" " Whitfield. Geol. Wiscons., vol. iv, p. 244, pl. ix, fig. 4.

One of the most abundant species of gasteropoda in the Trenton limestone of Manitoba is a large *Murchisonia* which the present writer has identified with the *M. major* of Hall, but which does not seem to differ materially from *M. bellicincta* except in size. Specimens of this *Murchisonia* (which had previously been collected at two localities on the Nelson River in Keewatin by Dr. R. Bell in 1879), were obtained by Mr. Weston, in 1884, at East Selkirk and Lower Fort Garry, at Elk. Big and Deer Islands, Big Grindstone Point, the Dog's Head, and Jack Fish Bay, Lake Winnipeg; by Mr. Tyrrell in 1889 at Berens (or Swampy) Island; and by Messrs. Dowling & Lambe in 1890 at Black Bear, Snake, Little Tamarack and Jack Head islands, in Lake Winnipeg. All the specimens from these localities, like those of *M. major* from Wisconsin, are mere casts of the interior of the shell, which are imperfect at both ends but especially so at the larger end. They rarely exceed four inches and a half in length and not more than six volutions are preserved. Not a vestige of the surface ornamentation can be detected on any of them, and indeed Professor Whitfield has expressed the opinion that the fossils from the States of New York and Wisconsin, which have been described as *M. bellicincta* and *M. major*, are not true Murchisonias, as, so far as he has observed, "none of them show any evidence of having been marked with a revolving band." In regard to the typical form of *M. bellicincta* it may be remarked that Ferdinand Roemer has figured a European specimen of it, in which the spiral slit-band, and backwardly divergent growth lines are clearly shown on each of the volutions, on Plate v, fig. 7, of the Atlas to the first volume of the *Lethæa Geognostica*, published in 1876.

In 1890 Messrs. Dowling & Lambe collected, at Berens Island, Lake Winnipeg, two specimens which throw quite a new light on this point and upon the characters and affinities of this large variety of *M. bellicincta*. One of these is upwards of seven inches and the other fully eight inches in length, and nine volutions can be counted in each. The shorter of the two has the test preserved on the last two

volutions, though the whole of the specimen has obviously been subjected to abnormal and lateral compression. Its surface markings consist of a broad, flat and nearly central, spiral slit-band, to which the growth lines on each side converge obliquely backward. Apart from its abnormal compression, this specimen is essentially similar in size, shape and surface markings, to the specimens from Gamache Bay, Anticosti, which Mr. Billings refers to his *M. teretiformis* (op. cit., p. 55) and upon which he bases the statement that "this species has a wide flat band about the middle of the whorl and appears to be a large variety of *M. bellicincta*, Hall."

It would thus appear that *M. major*, Hall, and *M. teretiformis*, Billings, are most probably synonymous, the former having been based upon very imperfect casts of the interior or the shell, and the latter upon more perfect and at least partially testiferous specimens. The name *teretiformis* is here used in a varietal sense, on the ground that it was the first prefixed to a sufficiently accurate diagnosis of the characters of the shell.

BUCANIA (TREMANTUS ?) BUELLII.

Bucania Buelli, Whitfield. 1878. Ann. Rep. Geol. Surv. Wiscons. for 1877, p. 76.

Bucania (Tremantus ?) Buelli, Whitfield. 1882. Geol. Wiscons., vol. iv, p. 224, pl. vi, figs. 12-14.

Lower Fort Garry, Dr. R. Bell, 1880, one specimen, and Commissioners, formerly called Cranberry Island, D. B. Dowling, one specimen, both of which are badly preserved casts of the interior of the shell.

BUCANIA SULCATINA.

Bellerophon sulcatinus, Emmons. 1842. Geol. Rep., 2nd Distr. N. York, p. 312, fig. 4.

Bucania sulcatina, Hall. 1847. Pal. St. N. York, vol. i, p. 32, pl. vi, figs. 10, 10 a.

Bellerophon sulcatinus, Billings. 1863. Geol. Canada, p. 146, fig. 96.

A single specimen of this species was found loose, on

Reindeer Island, by Mr. Dowling, in 1890, but no specimens have yet been collected, in place, in the Trenton limestone of Manitoba.

BUCANIA BIDORSATA.

Bucania bidorsata, Hall. 1847. Pal. St. N. York, vol. i, p. 186, pl. xl, figs. 2 a-g.

Birch Island, Kinwow Bay, Lake Winnipeg, Messrs. Dowling & Lambe, 1890: one specimen.

CYRTOLITES COMPRESSUS.

Phragmolites compressus, Conrad. 1838. Ann. Rep. N. York St., p. 119.
Cyrtolites compressus, Hall. 1847. Pal. St. N. York, vol. i, p. 188, pl. xl, figs. 2 a-f.

Lower Fort Garry, Dr. R. Bell, 1880: one small but well preserved and very characteristic specimen. East Selkirk, A. MacCharles, 1884: a large cast of the interior of the shell.

EUNEMA STRIGILLATUM.

Eunema strigillata, Salter. 1859. Geol. Surv. Can., Can. Org. Rem., Dec. 1, p. 29, pl. vi, fig. 4.
" " Billings. 1863. Geol. Canada, p. 145, fig. 88.

Lower Fort Garry, T. C. Weston, 1884: one nearly perfect and well preserved specimen.

HELICOTOMA PLANULATA.

Helicotoma planulata, Salter. 1859. Geol. Surv. Can., Can. Org. Rem., Dec. 1, p. 14, pl. ii, figs. 5-7.

East Selkirk, A. MacCharles, 1884: one good specimen, with the test preserved.

TROCHONEMA UMBILICATUM.

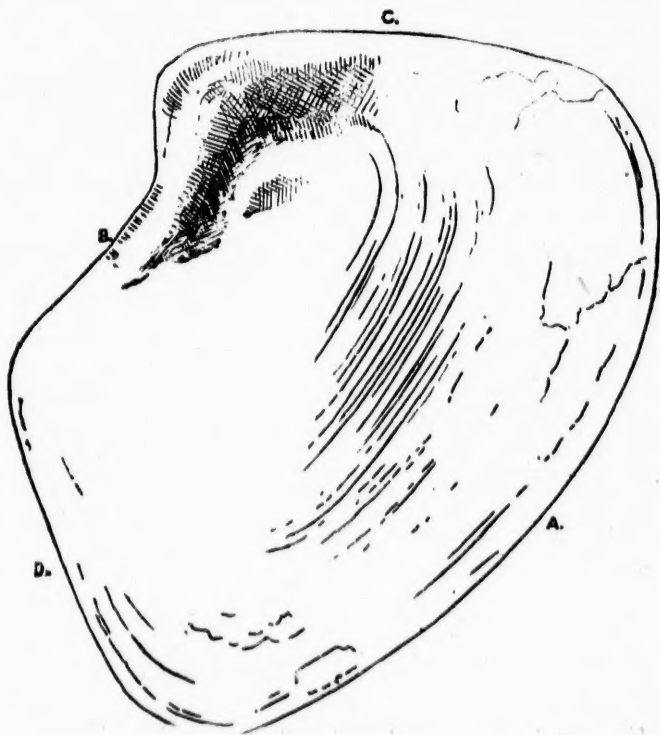
Pleurotomaria umbilicata, Hall. 1847. Pal. St. N. York, vol. i, pp. 43 and 175, pls. x, figs. 9 a-b, & xxxviii, figs. 1 a-g.

Trochonema umbilicatum, Salter. 1859. Geol. Surv. Can., Can. Org. Rem., Dec. 1, p. 27, pl. vi, fig. 3.
" " Billings. 1863. Geol. Canada, p. 145, fig. 92.

The Dog's Head, Lake Winnipeg, T. C. Weston, 1884: one specimen. Snake Island (one specimen) and Berens Island (one specimen), Lake Winnipeg, Messrs. Dowling and Lambe, 1890. Commissioners Island (one specimen) and Reindeer Island (one specimen, loose), Lake Winnipeg, D. B. Dowling, 1890.

MACLUREA MANITOGENSIS

Maclurea Manitobensis, Whiteaves. 1890. Trans. Roy. Soc. Canada vol. VII, Sect. 4, p. 75, pls. xii, & xiii, figs. 1 and 2.



Maclurea Manitobensis.—Inner side of an operculum, supposed to be that of a large specimen of this species, from Jack Fish Island, Lake Winnipeg. Natural size.

All the localities at which this species has been found, up to the close of 1889, are enumerated in the paper in which it was described. Since then it has been collected by Messrs. Dowling and Lambe in 1890 at Berens Island, at Sturgeon, Snake and Black Bear islands, Lake Winnipeg; by Mr. Lambe in 1890 at the Dog's Head; and by Mr. Dowling in 1891 at Commissioners, Little Tamarack and Punk Islands, also at Grindstone Point, Lake Winnipeg. It is one of the most abundant and characteristic fossils of the Trenton limestone of Manitoba, and according to Messrs. Weston, Tyrrell, Dowling and Lambe, it always occurs with the flat side uppermost in the rock.

In 1890 Mr. Lambe collected an operculum, which is probably that of a large specimen of this species at Jack Fish Island, Lake Winnipeg. This operculum, which is represented in outline in the wood cut on page 324, is a little more than four inches in height or depth, and not quite three inches in its maximum breadth. Its outer surface is completely buried in the matrix, the inner surface only being exposed. In the woodcut, the side indicated by the letter A clearly corresponds to the outer side of the shell, and the concave side opposite,—B,—to the inner or columellar side. The side marked C corresponds to the flattened spiral side of the shell, and that marked D to the inner wall of the umbilicus. The margins of the sides C and B, whose junction forms the "nuclear angle," are thickened, but the edges of the other two sides are very thin. This thickening of the sides C and B is immediately followed by a shallow depression in the nuclear region, but the inner side of the operculum is otherwise nearly flat. The surface markings of this side consist of numerous concentric raised lines of growth, but there are no clear indications of any "internal projections for the attachment of muscles." Although the opercula of *M. Logani*, Salter, and *M. crenulata*, Billings, are known to be provided with well developed muscular processes on the inner side, this is by no means always the case in other

species of the genus. On page 238 of the first volume of the "Palæozoic Fossils" of Canada, E. Billings distinctly states that there are no muscular processes on the inner side of the operculum of his *M. oceana*, and on page 243 of the same volume he figures opercula of two other species of *Maclurea*, from Cape Norman, Newfoundland, in which there are no muscular processes on that side. In the Museum of the Geological Survey at Ottawa, there are two opercula from the Calceiferous of the Mingan Islands, which were referred by E. Billings, with some doubt, to the *M. matutina* of Hall. There are no processes on the inner side of these opercula.

LOXONEMA WINNIPEGENSE. (Sp. nov.)

Shell large, attaining to a length of upwards of five inches, terebriform, elongated and nearly three times as long as broad: spire, as measured on the dorsal side, occupying not quite two-thirds the entire length: apical angle 27° . Volutions ten, allowing for the apical one, which is broken off in all the specimens collected, increasing slowly in size and obliquely compressed, the later ones slightly constricted above and moderately inflated below, those of the spire much broader than high: suture distinctly compressed: outer or last volution a little higher than broad, moderately convex but scarcely ventricose in the middle and narrowing abruptly into the somewhat pointed base.

Surface of the spire nearly smooth, that of the last volution marked only with a few flexuous lines of growth, which curve gently and concavely backward above, and still more gently forward below.

Four fine large specimens of this species, each with nearly the whole of the test preserved, have been collected at as many different localities on or in Lake Winnipeg. Two of these specimens were collected by Mr. Weston in 1884, one at Stony Point and one at Jack Fish Bay; one by Mr. Tyrrell in 1889 at Berens Island; and one by Mr. Dowling in 1891 at the "Dog's Head."



Loxonema Winnipegense.—Dorsal view of a specimen from Stony Point, Lake Winnipeg, in outline only, and of the natural size.

Nine volutions are preserved in the most perfect of these specimens, the slender apex of each being broken off. In the perfect shell there must have been at least ten and probably as many as eleven volutions. The species is of considerable interest on account of its strikingly close similarity to some of the most typical Jurassic species of *Pseudomelania*.

FUSISPIRA VENTRICOSA.

- Fusispira ventricosa*, Hall. 1871. Twenty-fourth Rep. N. Y. St. Mus.
Nat. Hist., p. 229, pl. viii, fig. 6.
" " Whitfield. 1882. Geol. Wiscons., vol. iv, p. 245,
pl. ix, fig. 2.
" " Miller. 1889, N. Am. Geol. and Paleont., p. 405
fig. 676.

Abundant at many of the limestone exposures on the western shore of Lake Winnipeg and on the islands in that lake. It has been collected by Mr. Weston in 1884 at Lower Fort Garry; at Bull's Head, the Dog's Head, Big Grindstone Point, Big and Elk Islands: by Mr. Tyrrell in 1889, at Berens Island; by Messrs. Dowling and Lambe in 1890, at Berens, Snake and Black Bear Islands; by Mr. Dowling in 1890 at Commissioners and Punk Islands; and by Mr. Lambe in the same year at the Dog's Head.

OTTAWA, March 22nd, 1893.

